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THE THEORY OF EFFECTIVE PROTECTION AND  
RESOURCE ALLOCATION FURTHER EXAMINED\*

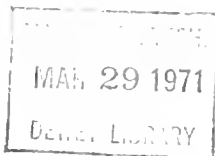
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\*This paper is a sequel to an earlier paper, "The Theory of Effective Protection and Resource Allocation," and examines new issues such as monopoly power in trade. The research of the former author has been supported by the National Science Foundation.

In an earlier paper (1971), we examined the validity of ERP theory, in predicting resource-allocational impact. In that paper, we explored four alternative, sufficient models for which an "appropriate" ERP index for this purpose could be devised: in each case, the trick was the availability of either a physical unit of value added, or a de facto or derived unit thereof. We also discussed the general Ramaswami-Srinivasan (1971) model where no such unit could be devised and where, therefore, ERP theory broke down.

In this paper, we extend the analysis in two directions. In Section I, we discuss our four sufficiency models again, but now allow for monopoly power in trade as distinct from the traditional ERP-theory assumption of given international prices. In Section II, we discuss these four sufficiency models again, but now relaxing the assumption of only two processes: this permits us to analyse the question of resource-allocational impact in a multi-commodity framework and also to examine the claim [cf. Balassa and Schydrowsky (1968)] that commodities ranked by their ERP are also ranked according to "comparative advantage."

## I: Monopoly Power in Trade

We treat the four sufficiency models, in turn.

### Model I: Two Primary, Domestic Factors Producing Two Traded Goods

In this traditional model of trade theory, we now drop the "small-country" assumption and let  $P_x$  and  $P_y$  be functions of the quantities of  $x$  and  $y$  traded. In this case, we must distinguish between the international

prices before and after the imposition of the tariff structure:  $P_x^f$  and  $P_y^f$  being the free-trade, international prices and  $P_x^t$  and  $P_y^t$  being the tariff-situation international prices.

(1) The "true" ERP's are then readily seen to be:

$$ERP_x = \frac{P_x^t(1+t_x) - P_x^f}{P_x^f} = \frac{P_x^t(1+t_x)}{P_x^f} - 1$$

and

$$ERP_y = \frac{P_y^t(1+t_y)}{P_y^f} - 1$$

It is next obvious that:

$$\text{if } \frac{P_x^t(1+t_x)}{P_x^f} > \frac{P_y^t(1+t_y)}{P_y^f} \quad (\text{i.e. } ERP_x > ERP_y)$$

then we must also have:

$$\frac{P_x^t(1+t_x)}{P_y^t(1+t_y)} > \frac{P_x^f}{P_y^f}$$

Hence,  $ERP_x > ERP_y$  implies that the tariff structure will have raised the domestic tariff-inclusive (relative) price of commodity x. Hence, we can validly argue that  $ERP_x > ERP_y$  implies that  $d(K_x) > 0$ ,  $d(L_x) > 0$  and  $d(X/Y) > 0$  (at positions of initial incomplete specialisation in production). Hence ERP theory is valid: the "true" definition yields correct predictions, even under monopoly power in trade.

(2) However, we lose now the advantage of being able to construct the relevant ERP index without first solving the general equilibrium system. Model I thus exhibits now the property of Models III and IV in our earlier paper, namely, that while an ERP index can be constructed which yields the

correct resource-allocational prediction, its calculation involves solving the general equilibrium system first, in which case we already know the resource allocation and do not need the ERP index in lieu thereof.

Besides, since we must know  $P_x^t$ ,  $P_x^f$ ,  $P_y^t$ , and  $P_y^f$ , to construct the ERP indices now, we have to solve the full general equilibrium system and not merely the production side thereof!

(3) And, knowing merely the tariff-situation prices,  $P_x^t$  and  $P_y^t$ , would not help at all. For, if we use only these and assume that they are identical between the two situations (as seems generally to be the custom in making empirical ERP calculations to date), we would calculate:

$$ERP_x = \frac{P_x^t(1+t_x) - P_x^t}{P_x^t} = 1 + t_x$$

$$\text{and } ERP_y = \frac{P_y^t(1+t_y) - P_y^t}{P_y^t} = 1 + t_y$$

Therefore,  $ERP_x > ERP_y$  if and only if  $t_x > t_y$ ; hence we would predict that activity x(y) has drawn (lost) resources if  $t_x > t_y$ . But this inference would clearly be wrong if, despite  $t_x > t_y$ , the "true" ERP's are:

$$\frac{P_x^t}{P_x^f} (1+t_x) < \frac{P_y^t}{P_y^f} (1+t_y)$$

which may well be the case if, for example, the foreign demand for x is more inelastic than for y, ceteris paribus.

(4) Suppose, on the other hand, that we are in the free-trade situation. We then have  $P_x^f$  and  $P_y^f$  but we do not have  $P_x^t$  and  $P_y^t$ . Therefore, following the same procedure as in the preceding case, we would calculate (the absolute values of) the ERP's as  $t_x$  and  $t_y$  in activities x and y respectively.

And again, for the same reasons as in the preceding case, the resulting prediction of resource-allocational impact of the tariff structure could be wrong.

(5) Hence, we must conclude that while, in Model I with monopoly power in trade now admitted therein, a definition of ERP exists--this being the "true" definition--it is impossible to use it without calculating information which can be obtained only by solving the entire (and not just the production side of the) general equilibrium system, in which case we already know the resource allocational impact, among other things, of the tariff structure and, from that viewpoint, need not bother about the ERP index at all.

Model II: Imported Input  $a_{ij}$ 's Constant and Strictly Positive and Two Primary, Domestic Factors

Recall that Model II does exactly the same thing for ERP theory as Model I, with two differences:

(1) We must think of "net" rather than "gross" outputs: as before, this poses no special difficulty and the "true" ERP index will accurately predict resource allocation in terms of both primary-factors and gross-output changes; and

(2) We can now analyse input tariffs as well; again, this creates no special problems and our analysis of output-tariffs carries over, mutatis mutandis, in this case as well.

Model III: One Primary, Domestic Factor and One Imported Input with Substitution Among Them, Producing Two Traded Goods

Recall that, in this model, when the international prices of the imported input (i) and the outputs (x and y) were given under the small-country assumption, the linear homogeneity of the two production functions assured us that this would be a knife-edge model: the real wage of labour was defined in each activity, given the tariff-structure, and labour would go entirely to whichever activity had the higher wage.

But the introduction of monopoly power in trade eliminates the knife-edge possibility. In general, wages will be equalised between the two sectors at positions of incomplete specialisation in production.

But, as soon as this happens, we must note that the ERP-index, in terms of the increment in the "price of value-added," which we introduced from Corden in the context of this model, yields equal ERP's in both activities, x and y: thus giving us the nonsense result that, no matter how the resources (whether gross outputs or the primary factor) move in this model thanks to the tariff-structure, the ERP's would be equal and thus erroneously indicate zero resource-allocational impact.

Thus, the "new" ERP definition will break down in Model III once monopoly power is admitted. And, as we have already noted in our earlier paper at length, the "old", "true" ERP definition does not work in this model anyway. Thus ERP theory now breaks down completely in this model.

#### Model IV: Substitution between "Value-Added" and Imported Factors

Recall that, in this model, the substitution between the primary factors (K and L) and the imported factor (I) is indirect and hence "un-biased": K and L produce a "value-added" product (G) which combines, and substitutes, with the imported factor to produce the final, traded goods (x and y).

Since the G's do not have to have equalised rentals (as the primary factor L in Model III), the introduction of monopoly power in trade does not create the difficulty which we have just noted in the preceding section. And we can therefore continue to assert the results of Model IV from the small-country analysis of our earlier paper: namely, that: (1) the "new" ERP-index will accurately predict the movement of primary factors; but (2) it will not so predict the relative change in gross outputs.

Note, however, that (as earlier) the general equilibrium system must be solved, and now in its entirety rather than just on the production side, before the correct ERP index can be computed. And this seriously limits the utility of the index as a predictor of resource-allocational impact of a tariff-structure.

## II: ERP's and "Comparative Advantage"

We now examine the question whether commodities, ranked by their ERP's, are also ranked by their "comparative advantage"--as claimed by Balassa-Schydrowsky (1968) and Grubel (1970), among others.

But, as soon as we analyse this question, it becomes obvious that the phrase "comparative advantage" could mean a number of different things. We would like to distinguish four definitions and then analyse our four sufficiency models, on the small-country assumption, to see whether ranking by ERP's is tantamount to ranking by "comparative advantage" under each of these definitions.

Definition (1): Country I has "comparative advantage" in commodity x and country II in commodity y if, at identical commodity price-ratios, country I produces a higher relative output of x (at positions of incomplete specialisation in production). This can be generalised to a multi-commodity, "chain" proposition by arguing that the different commodities can be ranked by an index of "comparative advantage" such that  $\frac{X_I}{X_{II}} > \frac{Y_I}{Y_{II}} > \frac{Z_I}{Z_{II}} > \dots$  such that the relative output of commodity x in I exceeds that of y and in turn that of z and so on, at identical commodity prices in both countries: and that we can therefore say that the commodities x, y, z, ... are ranked in terms of their "comparative advantage" in country I.

Thus, if  $ERP_x > ERP_y > ERP_z > \dots$ , we should be able to predict that in this country I,  $\frac{X_I}{X_{II}} > \frac{Y_I}{Y_{II}} > \frac{Z_I}{Z_{II}} > \dots$  at identical commodity prices for countries I and II.

Definition (2): A country has comparative advantage in commodities 1,...m and the other country in commodities m+1,...n if the former will export

1,...m and import m+1,...n in free-trade equilibrium. This is the customary meaning.

Thus, given the ERP-ranking among commodities, we should be able to predict which commodities will be exported and which imported in the free-trade situation.

Definition (3): For commodities 1,...n, in a country, we can rank them in a descending (ascending) order, by some index, such that the country will export (import) all commodities in this chain above (below) a point and import (export) all commodities below (above) this point: the free-trade pattern of trade will not involve a "criss-crossing" of the chain. This again is a customary way in which, in the Ricardian and Heckscher-Ohlin theories of comparative advantage, the commodities are ranked and described as being ranked in terms of their "comparative advantage."\*

Thus, if commodities are ranked by their ERP's, we should be able to assert that all exports will have lower ERP's than all imports.

Definition (4): Note that "comparative advantage" Definitions (1)-(3) related either to the pattern of trade of a country or to its production-advantage vis-a-vis its trading partner(s). But we might take a different kind of definition, a welfare-oriented definition, and turn the "comparative advantage" question into a resource-allocational question of the kind discussed in our earlier paper (1971). Since, for a small country, free trade is the optimal policy, we could now ask whether commodities ranked by their ERP's indicate how resources would (and, given the optimality of free-trade,

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\* Cf. Viner (1937) on Ricardo; and Jones (1956-57) on the Heckscher-Ohlin theory.

should) be re-allocated. We have, of course, analysed this problem in our earlier paper (1971) and we already know that, in the two-commodity (process) system, all our four sufficiency models work correctly. In this section, therefore, we will be extending the analysis to multiple commodities (processes).

#### Model I:

Confining ourselves initially to the two-commodity model, we note that the chain of ERP rankings in commodities  $x$  and  $y$  is identical with their tariff rankings:  $ERP_x > ERP_y$  implies  $t_x > t_y$ . We can readily argue that, for Definitions (1) and (2), even the 2-by-2 Model I will not work; and to examine Definitions (3) and (4), we consider many commodities later.

Definition (1): Having  $t_x > t_y$  does not imply that this country will have a higher relative output of commodity  $x$  than the outside world: no such proposition can be asserted, of course, without specifying the other parameters of the general equilibrium system of production in both countries.

Definition (2): For the same reason, it is not possible to infer anything about the trade pattern. Thus,  $t_x > t_y$  need not imply that  $x$  is the exportable good. In addition to the production side of the general equilibrium system, we would have to consider also the consumption side now.

To proceed to our analysis of Definitions (3) and (4), we must now extend the number of commodities beyond two. It is clear then that, contrary to the 2-by-2 model, (i) production of all commodities is not likely: generally, only two commodities will be produced; (ii) the relationship between commodity and factor prices is no longer single-valued;

and (iii) the Heckscher-Ohlin theorem will no longer hold. These three propositions can be readily illustrated for a 4-good  $(x, y, z, w)$  model in Figures (1) - (3). In Figure (1), assume that the commodity prices are such that  $\bar{x}$ ,  $\bar{y}$ ,  $\bar{w}$  and  $\bar{z}$  are equivalent at market prices. It follows then, by application of the Lerner technique, used by Findlay-Grubert (1959) and Findlay (1971), that only commodities  $x$  and  $z$  will be produced and the factor price-ratio will be  $AB$ . With  $OC$  and  $OD$  the factor proportion lines for  $x$  and  $z$  respectively, the overall  $\bar{K}/\bar{L}$  ratio for the economy is a weighted sum thereof, in the usual manner. Note that generally only two commodities will be produced: but that, if the  $\bar{y}$  and/or the  $\bar{w}$  isoquants are also tangential to  $AB$ , commodities  $y$  and/or  $w$  would also be competitively viable.

Figure (2), on the other hand, shows how the same commodity prices  $(\bar{x}, \bar{y}, \bar{w}, \bar{z})$  are compatible with two alternative factor price-ratios ( $AB$  and  $ER$ ); and how with factor-endowment ratio  $(\bar{K}/\bar{L})_1$ , the economy would produce  $x$  and  $y$ , with factor price-ratio  $AB$  and factor proportions in  $x$  and  $y$  at  $OC$  and  $OD$  respectively whereas with factor-endowment ratio  $(\bar{K}/\bar{L})_2$ , the commodities produced would be  $y$  and  $z$ , the factor price-ratio  $EF$ , and the factor proportions in  $y$  and  $z$  given by  $OM$  and  $ON$  respectively.

Finally, Figure (3) shows how the Heckscher-Ohlin theorem could break down. At identical, free-trade commodity prices, let again  $\bar{x}$ ,  $\bar{y}$ ,  $\bar{w}$  and  $\bar{z}$  exchange for one another in the market. Then all four commodities are competitively viable in each country, on the assumption of internationally identical production functions. The factor endowments being defined as  $(\bar{K}/\bar{L})_I$  and  $(\bar{K}/\bar{L})_{II}$  in countries I and II respectively, we then have multiple production equilibria possible in each country. Assume then that country I produces  $x$  and  $w$  whereas country II produces  $y$  and  $z$ ; assuming further that

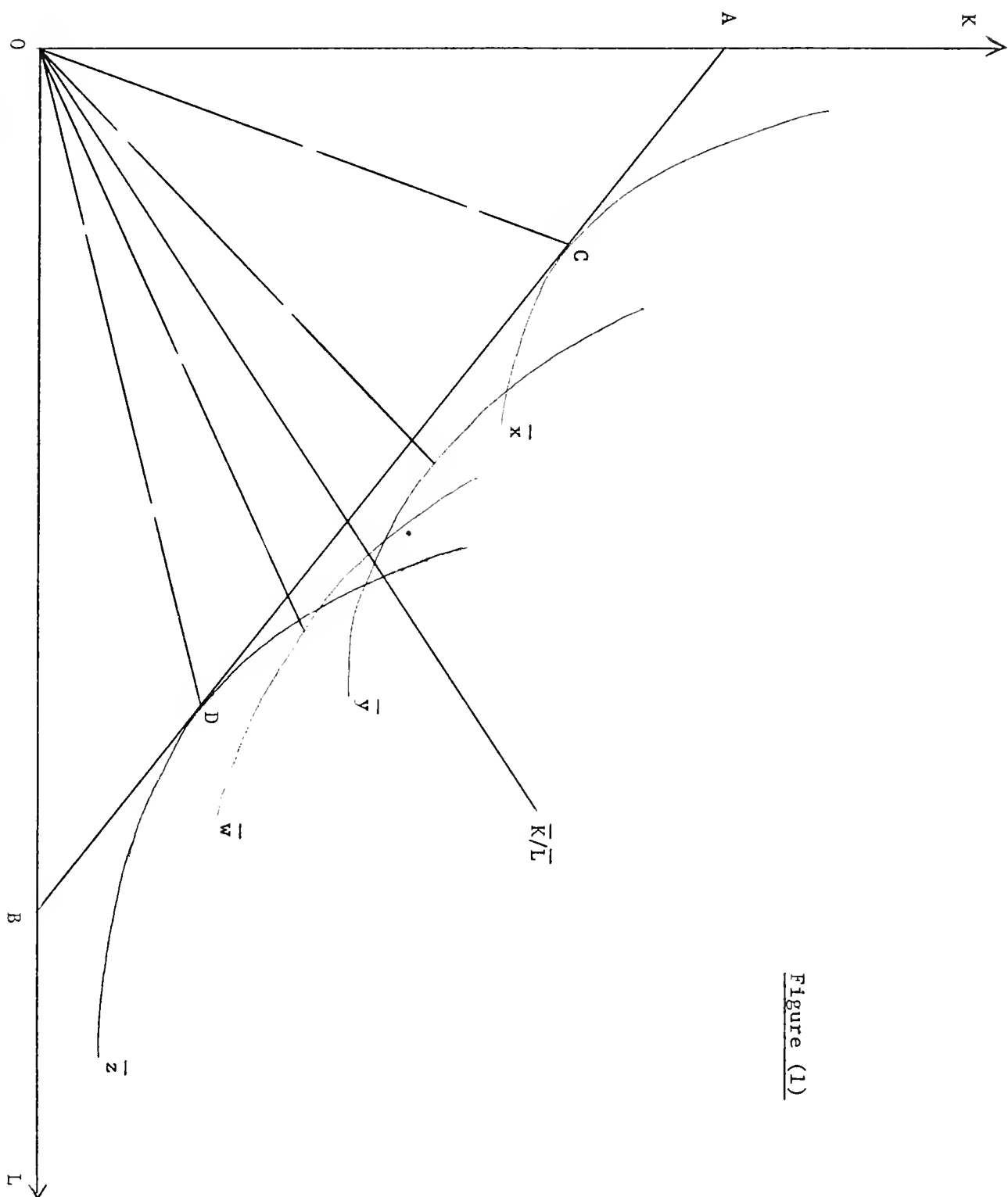


Figure (1)

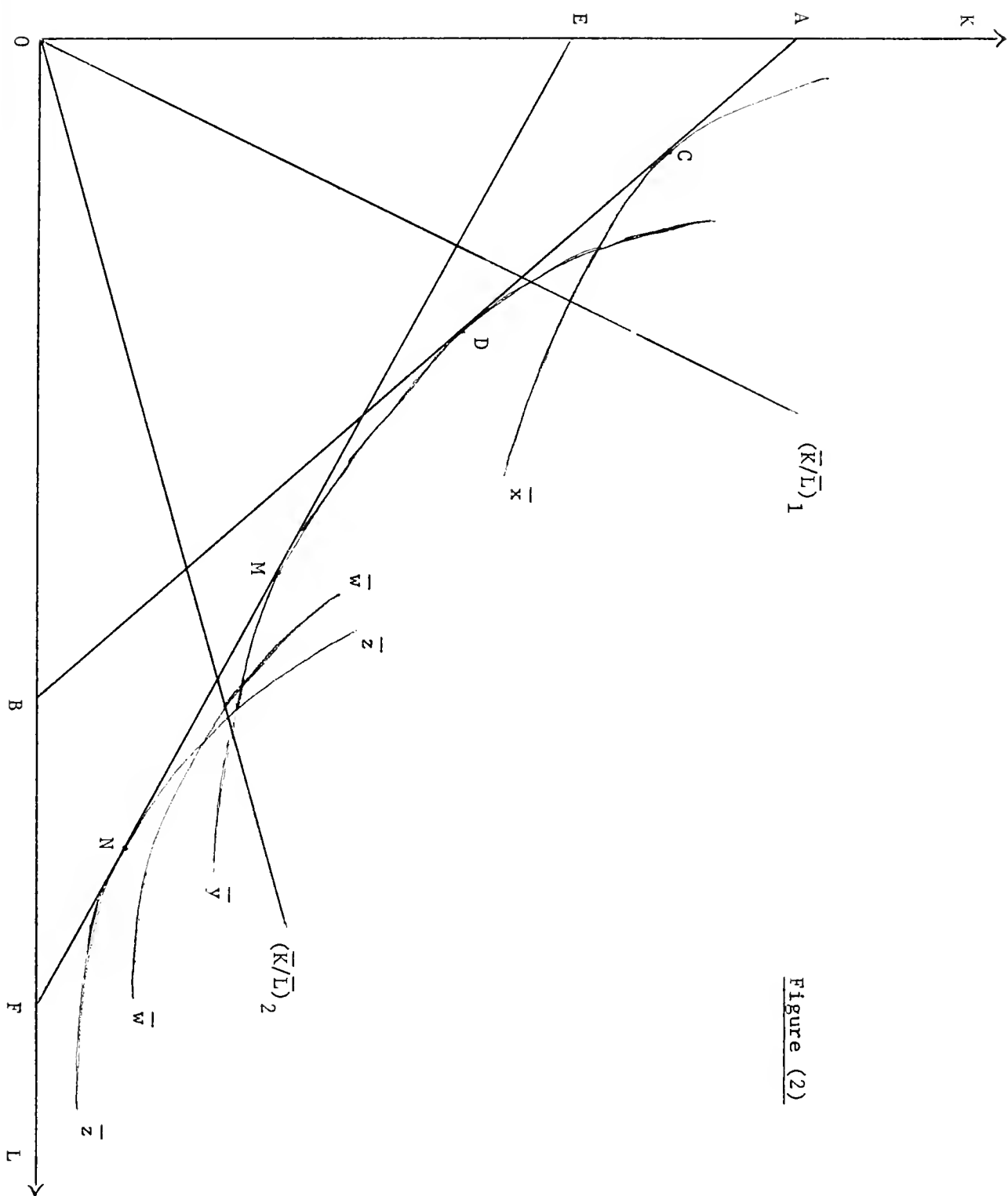


Figure (2)

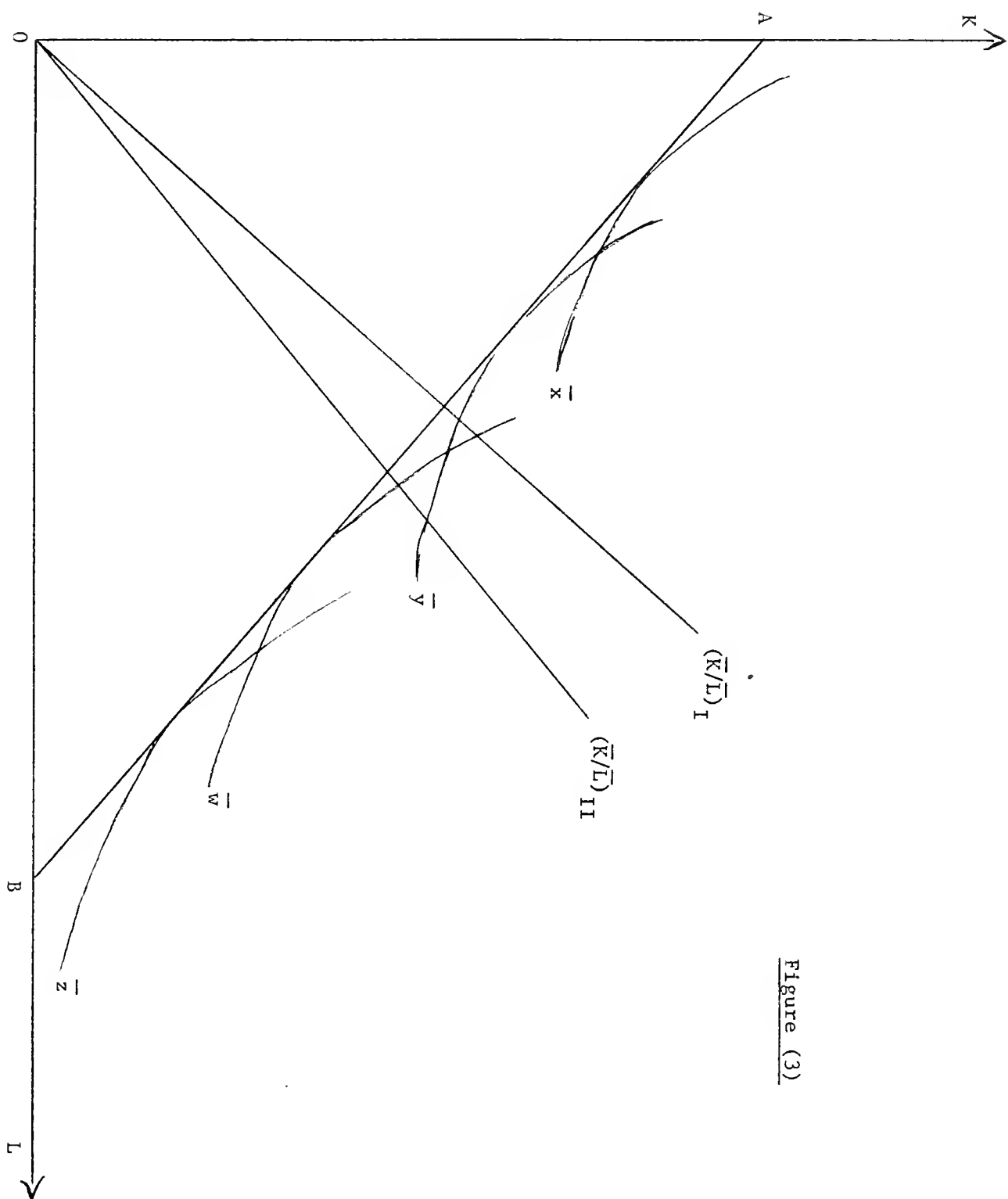


Figure (3)

each country consumes some of each commodity, we have country I exporting x and w while country II exports y and z. But the commodities are ordered in a chain of K/L ratios such that  $K_x/L_x > K_y/L_y > K_w/L_w > K_z/L_z$  and we would therefore expect, since  $(\bar{K}/\bar{L})_I > (\bar{K}/\bar{L})_{II}$ , that all of I's exports would be K-intensive in relation to all of I's imports: but this is not so. In short, the "comparative advantage" chain can be criss-crossed by the actual trade pattern in the Heckscher-Ohlin model.

Definition (3): In this many-commodity, two-factor world, therefore, it is unlikely that ERP-rankings could provide a chain of comparative advantage, either. And this is indeed the case. Thus take Figure (3) itself. Here the ERP's are zero, for each commodity, in the free-trade situation depicted. And yet, weakly ranked as the four ERP's are, x and w are exported and y and z are imported, in our example. Take further a tariff-inclusive situation in Figure (4), where x and z are produced under free trade, the free-trade prices implying exchange of  $\bar{x}$ ,  $\bar{y}$  and  $\bar{z}$ . Then, a tariff is imposed, sufficiently large to make y viable, so that the tariff-inclusive  $\bar{y}_t$  is tangential to AB. Then the ERP-ranking is:

$$ERP_y > ERP_x = ERP_z$$

But z could well be an importable and x an exportable, so that no clear chain principle is at work. If further we assumed that w, which is the least competitive at free-trade equilibrium, were given a sufficiently large export subsidy to make it viable at AB, then we would have:

$$ERP_w > ERP_y > ERP_x > ERP_z$$

and we could have w and x as exportables and y and z as importables. Clearly therefore ERP-rankings provide no basis for asserting that the commodities so ranked are in a chain of comparative advantage, in the sense of Definition (3).

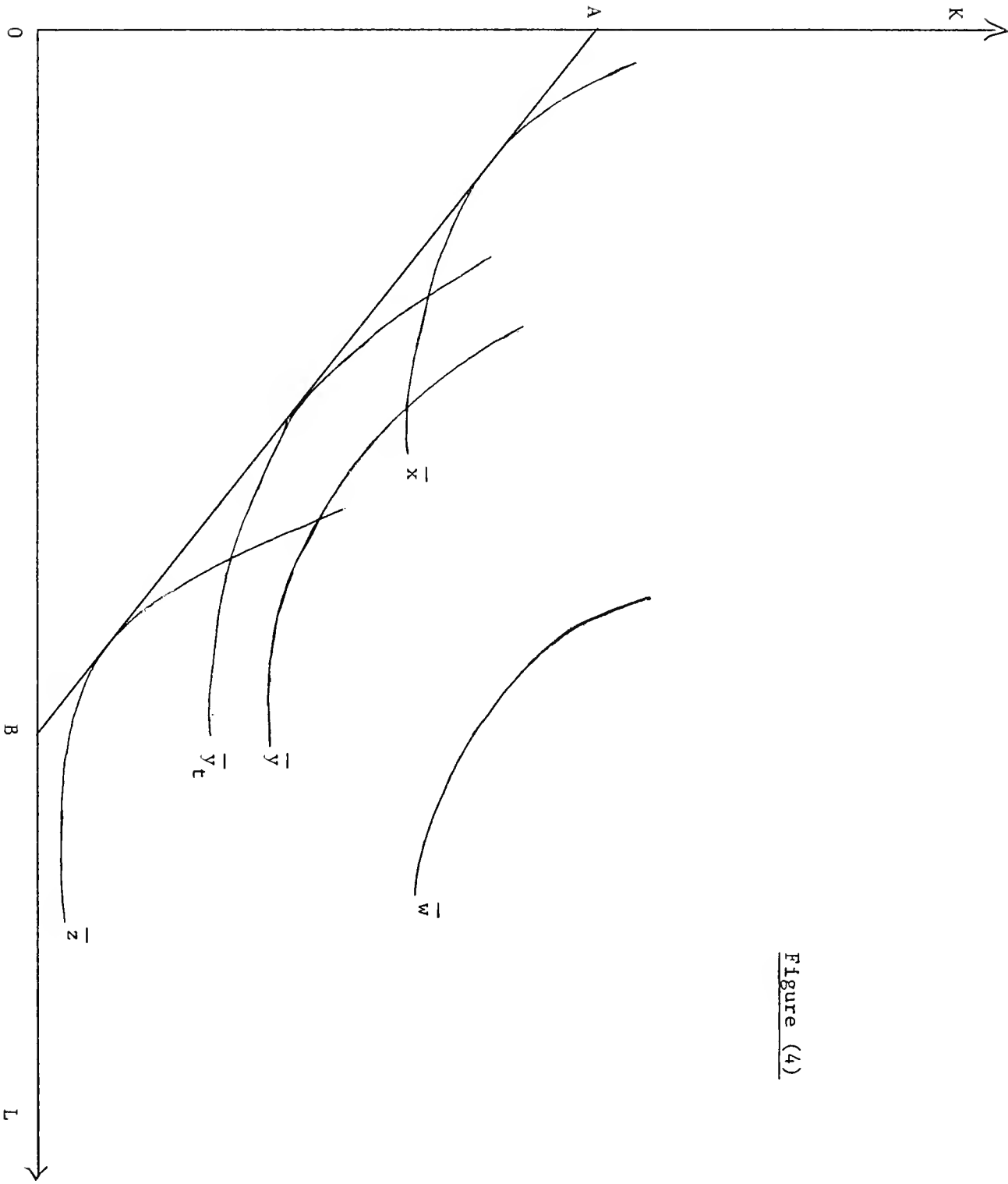


Figure (4)

Definition (4): Can we then rescue at least the resource-allocational inference from ERP rankings? Now, in the 2-by-2 case, we already know that  $ERP_x > ERP_y$  means  $t_x > t_y$  and that this implies that resources would be pulled away from x and towards y if free trade (i.e. the optimal situation) were restored. But what can we infer from ranking ( $n > 2$ ) commodities in a chain by their ERP's in the tariff-inclusive situation?

It turns out that, as we should expect, the most that can be inferred from such a chain is that (1) the activity with the highest ERP will lose resources and (2) an activity with the lowest ERP will gain resources, if free-trade were restored. Conversely, in relation to free trade, (1) the activity with the highest ERP will have gained resources and (2) an activity with the lowest ERP will have lost resources.

The latter proposition can be illustrated in Figure (5). Under free-trade, the factor price-ratio is AB and the produced commodities are x and z; the production of y and w is not viable. With a tariff on y, the post-tariff situation results in factor price-ratio CD and the commodities produced now are x and y, with z going out of production. Thus:  $ERP_y > ERP_x = ERP_z = 0$ ; and we can infer from it that x and/or z will have lost resources to y: in our example, z definitely loses resources.

Note, however, that (i) in ranking activities, we must take into account all activities and not just the ones observed in operation in any one situation; and (ii) obviously enough, an activity may have the highest ERP and yet not be viable, so that the highest-ERP activity which definitely draws resources is the one which is viable in the tariff-situation. The latter clarification does mean, however, that we again do not know, except by solving the general equilibrium (production) system, which is the relevant "highest-ERP" (if our initial situation is one of free trade). This is

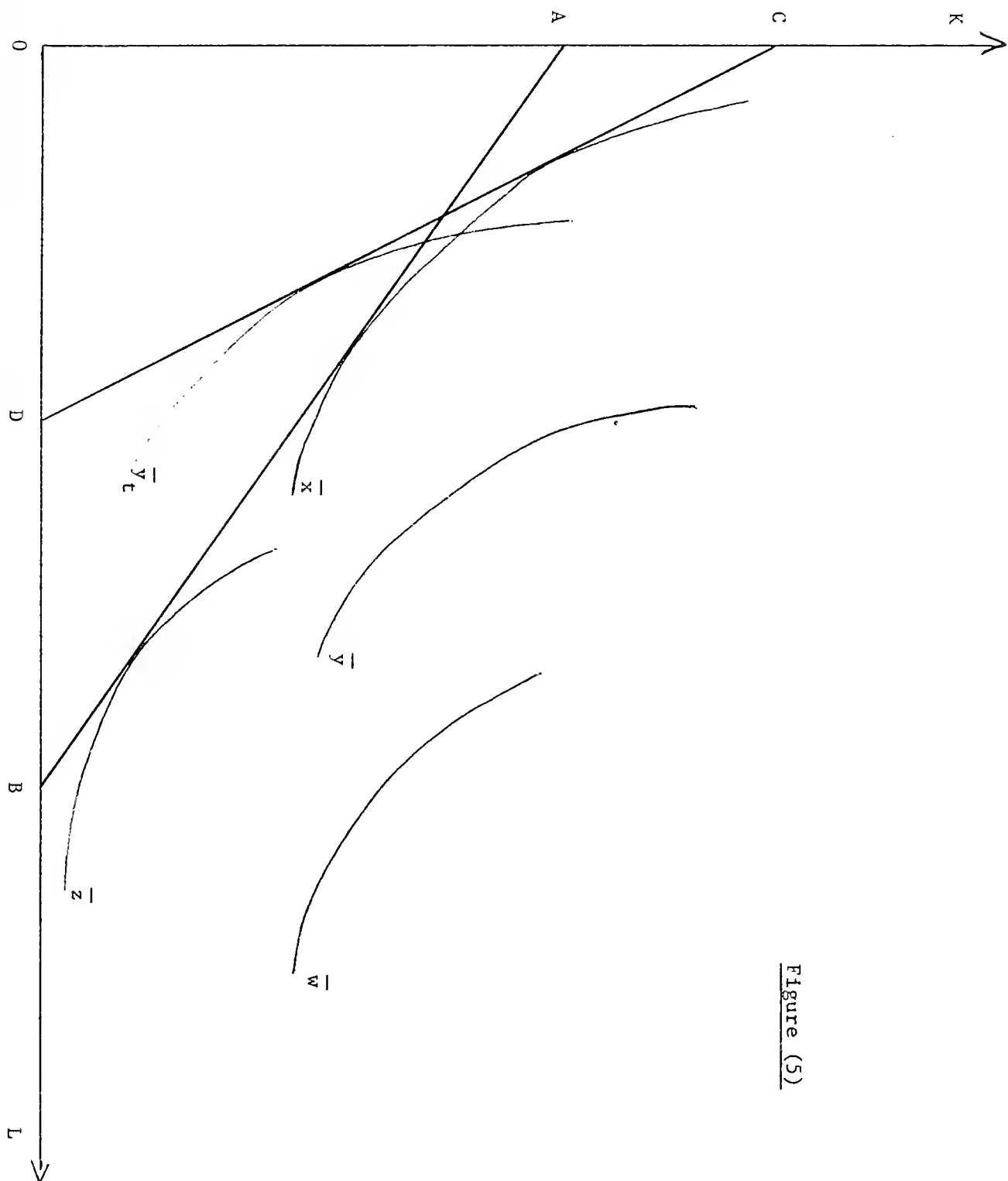


Figure (5)

readily seen in Figure (6). There, it is clear that  $w$  has the highest ERP and it is also clear that, starting from the free-trade factor price-ratio, one would predict that  $w$  would become viable (as the tariff-inclusive  $\bar{w}_t$  if below AB). But, as it happens, the tariff-equilibrium factor price-ratio would be CD and activity  $w$  would remain unviable anyway. Hence, only knowledge of the general equilibrium solution in the tariff-shifted equilibrium would really enable the ERP-analyst, starting from the free-trade position, to predict correctly the resource-allocational impact of the tariff structure being imposed, even if one is content to stick to forecasting, as one must be, the effects on the highest-ERP and the lowest-ERP activities.

#### Model II:

Since, as noted in our earlier paper (1971), Model II can be readily reduced to Model I, by using the notion of "net" output, given the constancy of the (imported)  $a_{ij}$ 's and their prices, all our conclusions in Model I carry over into Model II and no further analysis is called for.

#### Model III:

In the two-commodity version of Model III, we recall that we can solve the system for the wage of labour in terms of the imported-input price ( $P_i$ ) or the output price. The former helps us to discuss the effect of input tariffs on the allocation of labour; the latter the effect of output tariffs. In the following analysis, we concentrate on the former alone: as with our earlier paper (1971), the results for output-tariffs are identical for ERP theory.

Definition (1): We have plotted the  $w(P_i)$  curves for four commodities ( $w$ ,  $x$ ,  $y$  and  $z$ ) in Figure (7). Since we wish to focus on the two-commodity

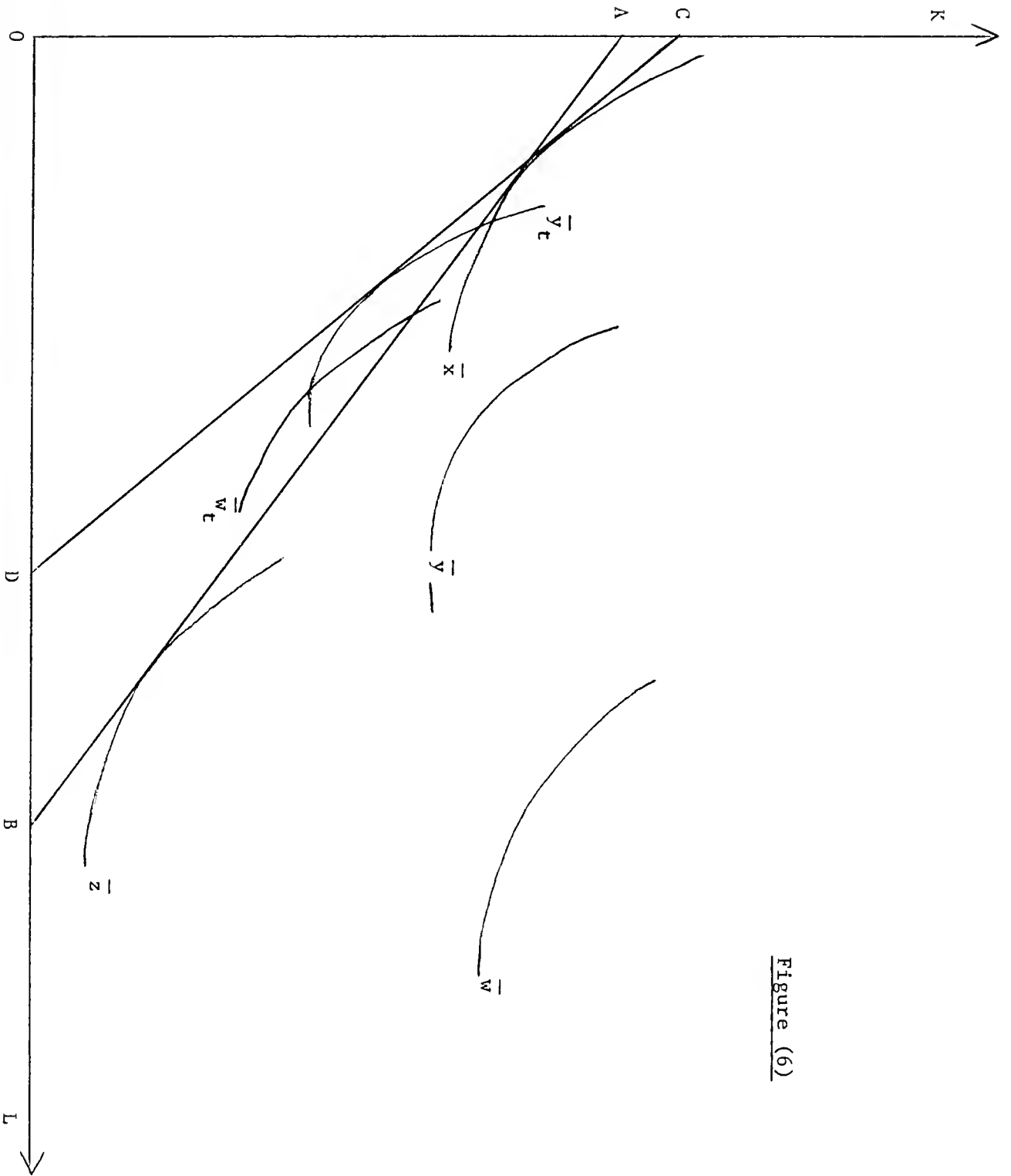


Figure (6)

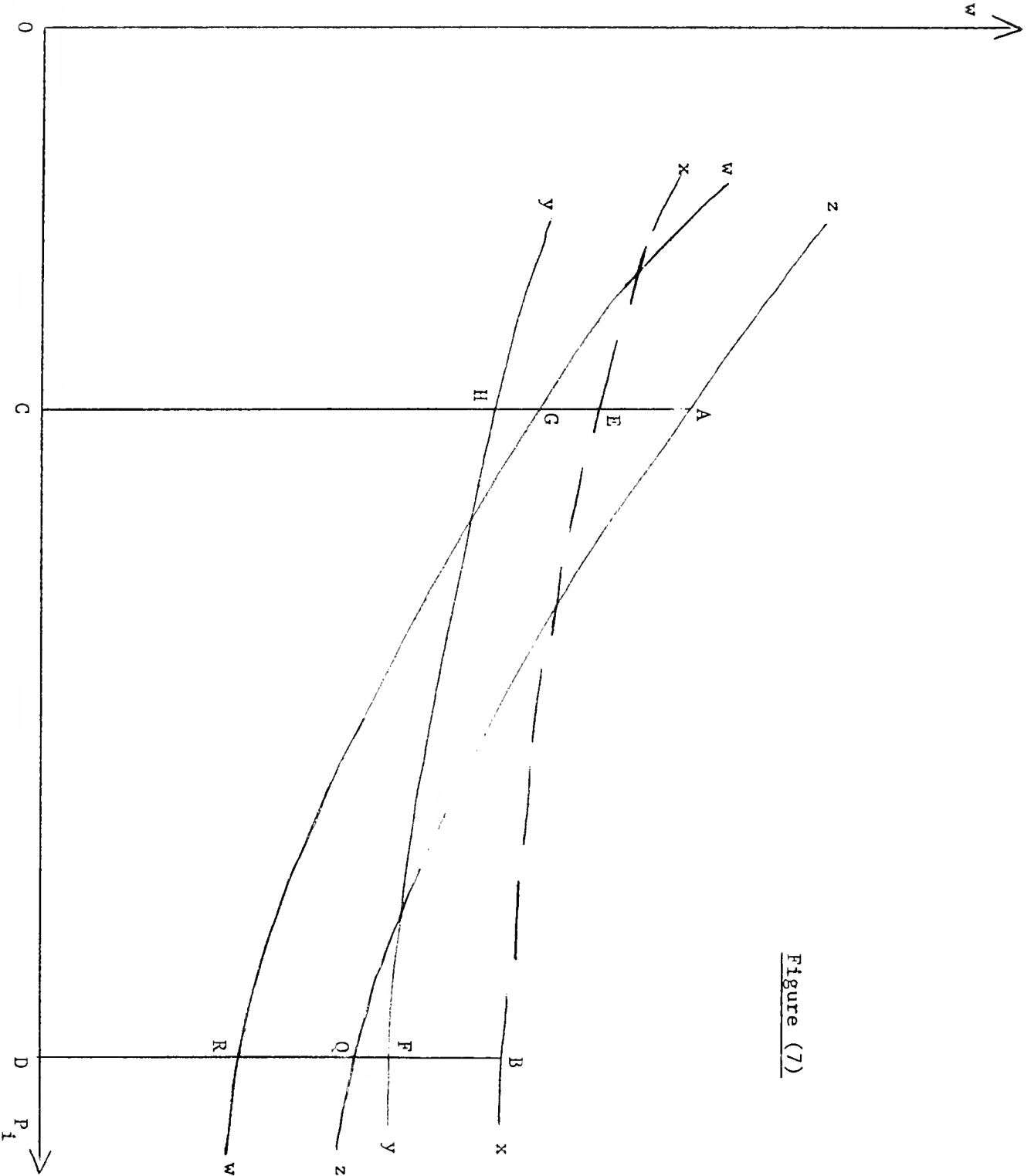


Figure (7)

model now, concentrate just on two commodities, x and z, and banish the other two from the diagram. Then we recall that ERP is defined, in the post-tariff situation where the tariff-inclusive price is C, as:

$$ERP_z = \frac{AC}{QD} - 1 ; \text{ and } ERP_x = \frac{EC}{BD} - 1$$

so that  $ERP_z > ERP_x$  and specialisation is on commodity z. With complete specialisation on z, it is not meaningful to say whether, on Definition (1), the country has "comparative advantage" in z: in fact, the outside world may well be specialised on z also at the same commodity price ratio. As noted for Models I and II, nothing can be said about comparative advantage in the sense of Definition (1) without bringing in the other parameters of the general equilibrium system in all countries.

Definition (2): However, we can say that if  $ERP_z > ERP_x$ , commodity z will be produced and therefore exported (under balanced trade, of course). The "comparative advantage" Definition (2) will therefore work for this country: z will be exported and x imported if there is a positive demand for both goods in the country; and  $ERP_z > ERP_x$  does predict that.

But now let us consider more than two commodities. Take now the  $w(P_i)$  curves for all four commodities, for the given commodity prices, in Figure (7). The ERP's in the tariff-situation at C, as relative to the free-trade situation at D, are:

$$ERP_z = \frac{AC}{QD} - 1$$

$$ERP_x = \frac{EC}{BD} - 1$$

$$ERP_y = \frac{HC}{FD} - 1$$

$$ERP_w = \frac{GC}{RD} - 1$$

And, under free-trade, specialisation would be on x. Hence, with positive demand for all goods in the country, we have the following result:

Importables	Exportables
y, z, w	x

But we cannot necessarily predict this pattern of trade from the ERP rankings which show that:  $ERP_z > ERP_x$  but where it is possible to have  $ERP_x > ERP_y$  and  $ERP_x > ERP_w$  so that the least-ERP activity is not necessarily the exportable good in the free-trade situation. It is only if we exclude (arbitrarily) the goods which are non-produced in both the tariff and the free-trade situations that we can stick to the (x, z) pairwise ERP ranking and salvage the ERP prediction of "comparative advantage" on Definition (2).

Definition (3): We can already see, from the preceding subsection, that the ERP-ranked commodities do not represent a chain such that exports and imports will not criss-cross. Thus, it is perfectly possible to have:

$$ERP_z > ERP_x > ERP_y > ERP_w$$

and yet to have x exported and z, y and w imported.

Definition (4): We cannot rescue the resource-allocational inference either in this model. Recall that when the economy shifts from free trade to the input-tariff situation, it moves from D to C and hence from x-specialisation to z-specialisation. Hence the ERP rankings at C should predict the reverse specialisation under free trade and hence we should have  $ERP_x$  lowest in the chain and  $ERP_z$  highest in the chain. But we have already seen that we can have  $ERP_z < ERP_y$  (or  $ERP_w$ ) and  $ERP_x > ERP_y$  (or  $ERP_w$ ), consistently with  $ERP_z > ERP_x$ . Thus ERP-rankings, in themselves, cannot help us infer the resource-allocational impact even for the highest-ERP and lowest-ERP activities

in a multi-commodity world--unless, of course, we arbitrarily exclude from the computation the activities which would remain unproduced in both the situations.

Strictly speaking, therefore, the inference of "comparative advantage" in any of the senses distinguished in this paper, once we have a multi-commodity Model III, could be inaccurate: and hence the assertion to the contrary is erroneous. Thus, as with Models I and II, where also only the arbitrary disregard of ERP's on non-produced commodities in both situations could salvage the inference about commodities at the end of the (thus-restricted) chain, ERP theory disintegrates.

#### Model IV:

As in our earlier analysis (1971), the results for Model IV are even more damaging to any claim that ERP-rankings can predict resource-allocation and "comparative advantage."

Definition (1): It is manifest that, even in the simple, two-commodity (x and y) version,  $ERP_x > ERP_y$  in a country cannot imply that it has production advantage in commodity x vis-a-vis the rest-of-the-world!

Definition (2): For the same reasons, we can readily argue that  $ERP_x > ERP_y$  cannot in itself imply that commodity y is exported and x imported.

Definition (3): Can we however argue that, if  $ERP_x > ERP_y > ERP_z > ERP_w$ , the pattern of trade under free-trade will not involve a criss-crossing of the chain?

We will examine this question for the case where we retain two primary factors (K and L) but increase the commodities to  $n > 2$ .<sup>\*</sup> Hence, for the

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<sup>\*</sup>The results for the case with n primary factors and commodities ( $n > 2$ ) are equally nihilistic for ERP-theory.

special 4-commodity case, we have the model:

$$X = X\{G_x(K_x, L_x), I_x\}$$

$$Y = Y\{G_y(K_y, L_y), I_y\}$$

$$Z = Z\{G_z(K_z, L_z), I_z\}$$

$$W = W\{G_w(K_w, L_w), I_w\}$$

$$K_x + K_y + K_z + K_w \leq \bar{K}$$

$$L_x + L_y + L_z + L_w \leq \bar{L}$$

Recall that, embedded in this system, is the "traditional" model in terms of G's, K's and L's alone. And, with the ERP's defined in terms of the changes in the "price" of G's, we get back into Model I. Thus, if the tariff-structure raises the price of  $G_x$ ,  $G_y$ ,  $G_z$  and  $G_w$  by proportions in descending order of magnitude, we can argue that  $G_x$  will lose resources under free-trade,  $G_w$  will gain them and nothing can be said in general about the middle-of-the-chain  $G_y$  and  $G_z$ . It follows, therefore, that  $ERP_x > ERP_y > ERP_z > ERP_w$  (necessarily) implies (merely) that  $G_x$  will have increased, and  $G_w$  decreased, under the tariff-structure.\* But we can no longer deduce (necessarily) that  $K_x$  and  $L_x$  will have gone up and  $K_w$  and  $L_w$  diminished.

Thus, we can no longer maintain even that the highest-ERP activity will draw primary resources to itself and the lowest-ERP activity lose them when free-trade is removed and the tariff-structure imposed. And, as in our earlier (1971) 2-by-2 analysis, nothing can be asserted about gross

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\* But the production structure of G's may have shifted from the production of, say,  $G_y$  and  $G_w$  in free trade to that of  $G_x$  and  $G_z$ ; and note also that  $G_x$  may not be produced under either situation at all (if the tariff is not sufficient to make it viable).

output changes in any case. Hence, ERP-theory breaks down totally, in relation to resource-allocational predictions: nothing can be asserted even for commodities at the end of the ERP-ranked chain (even if we arbitrarily exclude the commodities which would remain unproduced in both situations).

### III: Concluding Remarks

Our analysis thus confirms the nihilistic conclusions of our earlier paper (1971).

(1) The introduction of monopoly power in trade makes the construction of ERP-indices dependent on solutions of the entire general equilibrium system even in the simple Models I and II and makes them in fact unworkable in Model III.

(2) The introduction of many commodities makes the resource-allocational inference extremely limited in scope in theory, and even more so in practice, in Models I-III, while rendering ERP theory totally impotent in this regard for Model IV.

(3) Finally, our discussion of alternative definitions of the concept of "comparative advantage" shows that almost none of them can sustain the recent claims {e.g. by Balassa-Schydrowsky (1968)} that commodities, when ranked by their ERP's, are also ranked by "comparative advantage."

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